1,060,389

PATENT SPECIFICATION 1,060,389

DRAWINGS ATTACHED.

Date of Application and filing Complete Specification:
May 20, 1964. *No. 20874/64.*

Application made in United States of America (No. 281,410) on May 20, 1963.

Complete Specification Published: March 1, 1967.

Index at Acceptance:—B8 T(3B, 8E, 9A); B8 P(2A1, 2G, 8J, 9B1, 9K, 17).
Int. Cl.:—B 67 b /B 65 d.

COMPLETE SPECIFICATION.

Tamperproof Closure for Dispensing Containers.

We, ABBOTT LABORATORIES, a Corporation organized and existing under the Laws of the State of Illinois, United States of America, of 14th Street and Sheridan Road, North Chicago, County of Lake, State of Illinois, United States of America, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention relates to a tamper-proof closure for a dispensing container, and to a dispensing container embodying the tamper-proof closure. More particularly the invention relates to a so-called tamper-proof container having a wall member with a dispensing opening therein and a closure member which, as initially assembled on the wall member, is held in a position closing the dispensing opening by an element which must be torn away to release the closure member for service use but, if the tearing is by an unauthorized person, leaves visible evidence of the tampering.

The primary object is to provide a closure of the above character which may be molded as a single piece of resilient yieldable plastics material and in which the closure member remains permanently attached to the wall member after removal of the tamper-proof element.

The invention also provides a single piece plastics material molding which permits assembly into a container by insertion of a closure plate by means of automatic machinery.

Accordingly the present invention provides a tamper-proof closure for a dispensing container, the closure comprising a single piece molding of resiliently yieldable plastics material comprising a wall member adapted to form at least part of a wall of the container and having a dispensing opening therein, a closure member for covering said opening, a flexible web integrally joined at opposite sides to an edge of said wall member and to an edge of the closure member spacing said members one from another and bendable to permit bodily swinging of said closure member through a half revolution to a position over the dispensing opening, coupling formations on corresponding portions of said members when in face to face relation adapted, during final pressing of the members together, to inter-engage with each other and couple said members permanently together with the closure member covering said opening, but also adapted, after severance of said web, to permit movement of the closure member relative to the wall member to uncover and recover said opening while the closure member remains permanently coupled with the wall member.

Other objects and advantages of the invention will become apparent from the following detailed description taken in connection with the accompanying drawings, in which

FIGURE 1 is a perspective view of a container equipped with a closure according to the present invention.

FIGS. 2, 3, and 4 are similar views showing the parts in different positions.

FIGS. 5 and 6 are sections taken along the lines 5—5 and 6—6 of FIG. 1.

FIG. 7 is a perspective bottom view of a part of the container.

FIGS. 8 and 9 are fragmentary sectional views showing different positions of the closure member of the container.

In FIGS. 1 to 9, the invention is shown embodied in a box adapted to contain articles such as pills to be dispensed one by one through an opening 10 in a wall mem-

ber 11 and normally covered as shown in FIG. 1 by a closure member 12 but adapted to be exposed as shown in FIGS. 3 and 9 by upward swinging of the member about an axis 13 of a hinge 19. Herein, the wall member 11 and a narrow peripheral skirt 14 integral therewith form a shallow cup 15 for receiving the articles to be dispensed. After being filled, the cup 15 is closed and the box completed by a plate 16 (FIG. 5) pressed into the skirt with its beaded peripheral edge 18 seated with a snap action in a groove 17 formed around the interior of the skirt. The plate is preferably a relatively rigid sheet metal stamping while the cup, the closure member, and all of the connected parts of the single piece molding are composed of resilient yieldable plastics material such, for example, as polyethylene sold by DuPont under the trade name of Alathon-17.

To facilitate the dispensing of articles one by one, the cup 15 is made generally triangular in shape with the opening 10 near an apex. Extending around the interior of the apex and spaced from the skirt proximate the periphery of the dispensing aperture is an upstanding rib 20 (FIGS. 5 and 7) shaped and positioned to hold one of the articles opposite the opening 10 and into alignment therewith when the box is held in an upright plane with the opening at the lower end of the triangle.

The closure member 12 comprises a relatively flat and rectangular closure plate 21 and a tubular plug or skirt 22 of oval cross-section, integral therewith and depending from the plate intermediate the ends thereof and adapted to fit tightly within a wall 23 defining the dispensing opening 10. A snap fit is achieved by molding around the end of the plug a narrow and externally rounded flange 24 (FIG. 8) of slightly larger size than the hole 10. As the closure plate 21 is pressed against the wall member 11 with the plug aligned with the hole, the flange is guided into the hole by a bevel 25 (FIG. 8) at the end of the wall 23, is compressed in passing through the hole, and finally expands beneath the wall member 11 as the closure plate 21 comes against the outer face of the wall member 11. As the closure plate 21 is swung upwardly about the hinge 19 after severance of the strap 35, the flange 24 is compressed allowing the plug to be withdrawn from the hole to expose the dispensing opening as shown in FIGS. 3 and 9.

The hinge 19 comprises a relatively thin and flexible strap 26 forming part of the closure member 12 and constituting an extension of and integrally joined at one end to the inner end of the closure plate 21 and having a shallow groove 27 extending transversely thereof to define the line of bending or hinge axis 13. The innermost end of the hinge strap 26 is anchored to the wall 11 by a relatively flat lug 28 (FIGS. 4, 5, 6 and 8) integral with and perpendicular to the hinge strap just short of the inner end thereof and shaped to be received with a tight press and interlocking fit in a rectangular hole 30 molded in the wall member 11 and spaced inwardly from the dispensing hole 10 but adjacent to and beyond the hinge 19. To provide for such interlocking, the free edge portion of the lug is made somewhat longer than the length of the hole 30 and the ends 31 are beveled as indicated at 32 in Fig. 6. As the lug is pressed into the hole, it is compressed lengthways in passing through the hole after which the ends expand beneath the wall member 11 as shown in FIG. 6, thus anchoring the strap end permanently to the wall member 11. This occurs automatically in the initial assembly as the hinge strap and the closure plate 21 are pressed downwardly from the partially folded position shown in FIG. 8 to the fully assembled position shown in FIGS. 1 and 5 in which these parts become seated in a depression 33 whose peripheral contour conforms to but is slightly larger than the connected strap and closure whose exposed faces are substantially flush with the surface of the wall member 11 in the closed position (See FIGS. 1 and 5).

In accordance with the primary feature of the present invention and as shown in FIG. 4 and in phantom in FIG. 8, the closure plate 21 is, in the initial molding, horizontally disposed in a plane parallel to that of the wall member 11 in inverted relation with respect to the wall member 11 and integrally joined to the skirt 14 by a flexible strap or web 35 which is bendable to allow the closure member to be swung upwardly from its initially molded and inverted position and then laterally over the top of the wall member 11 to guide the plug 22 of the closure member 12 and the anchor lug 28 into approximate alignment with the holes 10 and 30 as shown in full in FIG. 8. With the parts thus oriented and held by the strap 35, proper entry of the plug and lug and interengagement with the walls of the holes may be effected simply by pressing the closure plate 21 and hinge strap 26 down against the wall member 11.

One end of the strap 35 is made integral with the outer end 36 of the closure plate 21 along a tear line 37 which is defined by weakening of the strap as by notching the edge thereof or preferably as shown by forming a shallow groove 38 (FIGS. 4 and 5) along the junction with the closure plate so as to control the line of cross-tearing to sever the strap. At its other end, the strap is similarly weakened and joined, in this instance at the bottom of a groove 40, to an adjacent edge of the skirt 14 to provide a well defined line 39 of tearing. While the

joint may be along any part of the skirt 14, it is preferred, in order to facilitate molding and minimize the angle of bending at any point along the strap, to locate the joint at or near the bottom of the skirt 14. Thus, in the original molding, the hinge strap 26 and closure plate 21 and the strap 35 are disposed end to end as shown in FIG. 4 and in phantom in FIG. 8 with the closure plug 22 and hinge lug 28 inverted relative to their positions of final assembly on the wall member 11. In this relation, it will be apparent that the closure, hinge, and wall members as well as the various formations thereon as above described are disposed to permit formation in a single plastic molding operation in the cavities of coacting dies while permitting separation of the dies and stripping of the molding therefrom without deforming any of the contours to an objectionable degree.

After cooling of the plastics material and removal of the molding in the form shown in FIGS. 4 and 8 from the forming dies, the closure and wall members 12 and 11 may be brought into proper assembled relation (FIGS. 1 and 5) for service use and the hinge 19 formed and anchored simply by bending the strap 35 to swing the closure plate 21 and strap 26 through a half revolution and press them to the wall member 11. Herein such bending takes place along the two lines 37, 39 at the bottoms of the grooves 38 and 40 which are spaced apart a distance about equal to the height of the skirt 14. Thus, the strap 35 is bent through a right angle from its initial position (FIG. 4) so as to be disposed parallel to and adjacent to the skirt 14. The closure plate 21 and hinge strap 26 are then bent in the same way through a quarter revolution about the bottom of the groove 38 as a fulcrum and thus swung over the top of the wall member 11 to guide and position the plug 22 and the lug 28 first into approximate alignment with the opening 10 and the hole 30 as shown in FIG. 8 so as to enter and interengage with the wall member 11 as shown in FIG. 5 under the application of further downward pressure.

After such bending of the molding and permanent coupling of the wall and closure members 11 and 12 by the anchoring of the hinge on the wall member 11, that portion of the strap 35 between the grooves 38 and 40 will be disposed vertically and adjacent to the skirt. To facilitate severance of the strap 35 and freeing of the closure member for opening and closing of the dispensing opening, means is provided for facilitating the gripping of the strap and the application of an outwardly directed tearing force to one side edge thereof. For this purpose, a pull tab 41 is molded integrally with one side edge of the strap 35 in the plane thereof so as to project tangentially from the skirt 14 and present a free end portion spaced from the skirt and adapted for easy grasping between the thumb and forefinger. After such gripping, the tab is pulled outwardly, thus tearing the strap crosswise along the lines 37 and 39 and removing the intervening portion of the strap as a separate piece 29 shown in FIG. 2 while leaving the torn edges 42 and 43 which do not detract materially from the artistic appearance of the box.

Preferably the tear line 37 is located at a point spaced outwardly a short distance beyond the apex of the cup 15 so that, after the strap is torn away, the free end 36 of the closure plate 21 overhangs the cup apex (FIG. 2) and provides a tab which facilitates finger gripping of the closure member when it is desired to lift the plug 22 and swing the closure member out of the way as shown in FIG. 9 to permit the dispensing of articles through the opening 10.

If such tearing is effected, the closure is conditioned for ordinary service use, that is, lifting the plug 22 out of the hole 10 and bending the closure plate backwardly to the position shown in FIG. 9 when it is desired to remove a pill from the container. Thereafter, the closure is swung reversely and pressed into the depression 33 to reclose the hole and bring the plate 21 and the strap 26 back to the closed position for carrying with their exposed surfaces flush with the surface of the wall member 11. If the tearing away of the strap 35 has been effected by an unauthorized person, the absence or deformation of the tap strap 35 indicates the possibility that one or more pills may have been removed from the container and provides a visual check if tampering by an unauthorised person is suspected.

WHAT WE CLAIM IS:—

1. A tamperproof closure for a dispensing container, the closure comprising a single piece molding of resiliently yieldable plastics material comprising a wall member adapted to form at least part of a wall of the container and having a dispensing opening therein, a closure member for covering said opening, a flexible web integrally joined at opposite sides to an edge of said wall member and to an edge of the closure member, spacing said members one from another and bendable to permit bodily swinging of said closure member through a half revolution to a position over the dispensing opening, coupling formations on corresponding portions of said members when in face to face relation adapted, during final pressing of the members together, to inter-engage with each other and couple said members permanently together with the closure member covering said opening, but also adapted, after severance of said web, to permit move-

ment of the closure member relative to the wall member to uncover and recover said opening while the closure member remains permanently coupled with the wall member.

2. A tamperproof closure according to Claim 1 additionally comprising indentations spaced apart along said web and defining lines for cross-tearing of the web and removal of the intervening portion thereof.

3. A tamperproof closure according to Claim 2 additionally comprising a pull tab projecting from said web between said indentations and adapted to be gripped manually to facilitate tearing said web whish web before severance thereof holds the closure member in a position closing said dispensing opening.

4. A tamperproof closure according to any of the preceding Claims wherein the wall member includes a dependent peripheral wall and said web after swinging of said closure member into inter-engaging relation with said wall member, is disposed adjacent and substantially parallel to the peripheral wall.

5. A tamperproof closure according to Claim 4 wherein the said web is integral with the bottom edge of said dependent peripheral wall.

6. A tamperproof closure according to any of the preceding claims wherein the coupling formations are a flexible strap formed by an edgewise projection of the closure member on the side thereof opposite said web and formations on said wall member and the free end of said strap adapted, during final pressing of the members together, to inter-engage with each other and anchor said strap end to said wall member and constitute at the part of the strap adjacent the edge from which it projects a hinge for swinging of said closure member into and out of closing position relative to said opening after severance of said web.

7. A tamperproof closure according to Claim 6 in which the coupling formation in the wall member is a hole in said wall member spaced from said dispensing opening inwardly from the periphery thereof and the coupling formation of the closure member is a lug on said strap adapted, when pressed through said hole, to inter-lock with the wall thereof.

8. A tamperproof closure according to any of the preceding Claims wherein the web before severance holds the wall member and closure member in their inter-engaged positions with said dispensing opening covered by said closure member.

9. A tamperproof closure according to Claim 9 wherein the closure member comprises a tubular plug adapted to sealingly engage the dispensing opening.

10. A tamperproof closure according to any of the preceding Claims wherein the plug is a member of oval cross-section slightly flared at the bottom end thereof, the flared portion being of a slightly greater cross-section than the dispensing opening and being composed of a resilient material to sealingly engage the dispensing opening.

11. A dispensing container comprising a tamperproof closure according to any of Claims 4 to 10 and a metal bottom member engaging the bottom edge of the dependent peripheral wall.

12. A dispensing container according to Claim 11 wherein the bottom member has a peripheral bead which seats in a peripheral groove formed near the bottom edge of the dependent peripheral wall.

13. A dispensing container according to Claim 11 or Claim 12 wherein the wall member has a dependent "V"-shaped channel portion with a rounded end, said rounded end being located proximate the periphery of the dispensing opening to guide articles to be dispensed from said container into alignment with the opening.

14. A tamperproof closure for a container substantially as hereinbefore described with reference to the accompanying drawings.

15. A dispensing container substantially as hereinbefore described with reference to the accompanying drawings.

PAGE, WHITE & FARRER,
Chartered Patent Agents,
27, Chancery Lane,
London, W.C.2,
Agents for the Applicants.

Abingdon: Printed for Her Majesty's Stationery Office, by Burgess & Son (Abingdon), Ltd.—1967.
Published at The Patent Office, 25 Southampton Buildings, London, W.C.2,
from which copies may be obtained.

Fig. 1

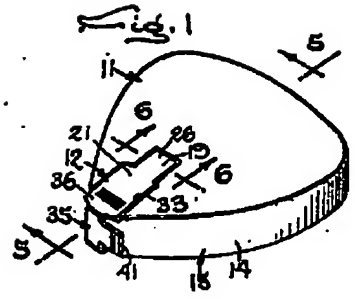


Fig. 2

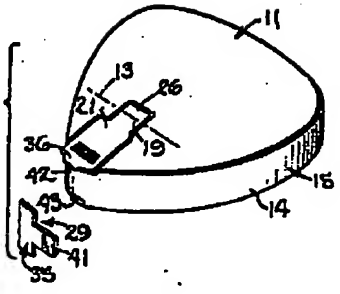


Fig. 3

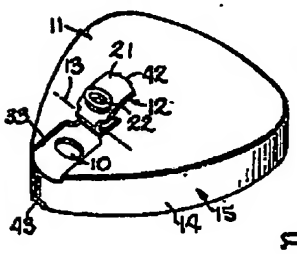
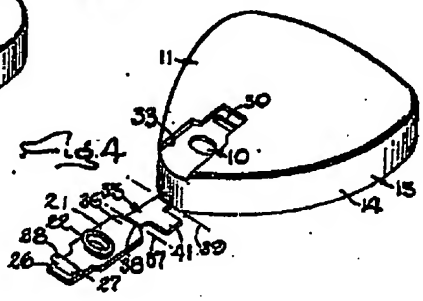


Fig. 4



1060389 COMPLETE SPECIFICATION
2 SHEETS *This drawing is a reproduction of the Original on a reduced scale*
Sheets 1 & 2

Fig.5

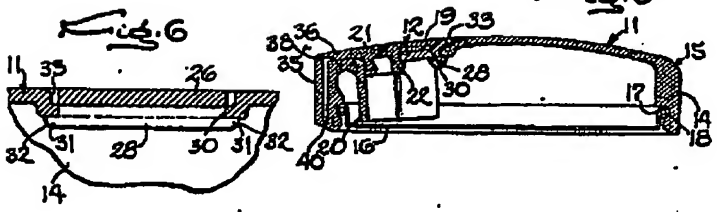


Fig.6

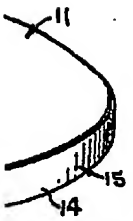


Fig.7

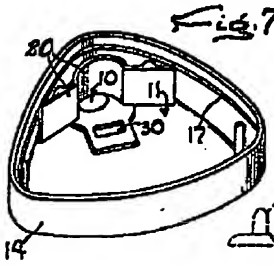
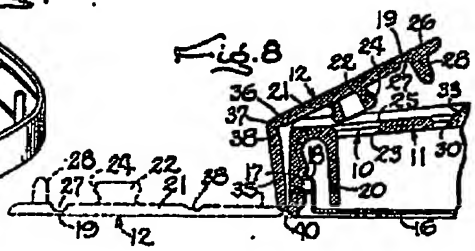


Fig.8



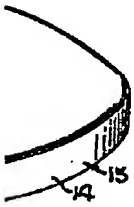
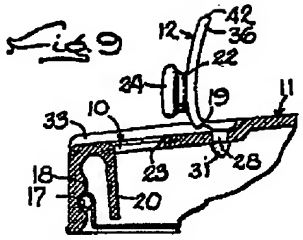


Fig.9



1060389 COMPLETE SPECIFICATION
2 SHEETS This drawing is a reproduction of the Original on a reduced scale
Sheets 1 & 2